

Patent claims:

1. Gene transfer vector which contains

- a) a transgene and
- b) a nucleic acid sequence coding for a surface marker,
characterized in that the surface marker is the CD34 surface antigen or a fragment of the same or a variant of the same.

2. Vector according to Claim 1, characterized in that the nucleic acid sequence codes for a surface marker in accordance with SEQ ID NO: 2, 4 or 6 or for a fragment or a variant of the same.

3. Vector according to Claim 1 or 2, characterized in that the nucleic acid sequence codes for the surface marker is the sequence indicated in SEQ ID NO: 1, 3 or 5 or for a fragment, a mutant or variant of the same.

4. Vector according to Claims 1 to 3, characterized in that it is a retroviral vector.

5. Vector according to Claims 1 to 4, characterized in that it contains a nucleic acid sequence coding for a further surface marker.

6. Vector with the accession no. DSM 13396.

7. Vector characterized in that it contains a nucleic acid sequence coding for the amino acid sequence according to SEQ ID NO: 6, a fragment or a variant of the same.

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8. Vector according to Claim 7, characterized in that it contains the nucleic acid sequence according to SEQ ID NO: 5, a fragment, a mutant or a variant of the same.

9. Host cell, characterized in that it is transduced with a vector according to Claims 1 to 8.

10. Host cell according to Claim 9, characterized in that it is a human cell.

11. Host cell according to Claim 10, characterized in that it is a T-lymphocyte.

12. Method for the detection of genetically modified cells, characterized in that the cells are transduced with a vector according to Claims 1 to 5 and the transduced cells are identified by detection of the surface marker.

13. Method for the selection of genetically modified cells, characterized in that the cells are transduced with a vector according to Claims 1 to 5, bound to an agent specific to the surface marker, and separated from the genetically unmodified cells.

14. Method for the detection and analysis of cells, characterized in that the cells are transduced with a vector which contains a nucleic acid sequence coding for the surface marker CD34, a fragment of the same or a variant of the same, and the transduced cells are identified by detection of the surface marker, in which the cells do not naturally express CD34, a fragment or a variant of the same.

15. Method for enriching cells which do not naturally express CD34, a fragment or a variant of the same, characterized in that the cells are transduced with a vector which contains a nucleic acid sequence coding for the surface marker CD34, a fragment of the same, or a variant of the same, and the transduced cells are bound to an agent specific to the surface marker, and separated from the cells which do not express the surface marker.

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16. Method according to Claim 14 or 15, characterized in that the nucleic acid sequence codes for a surface marker according to SEQ ID NO: 2, 4 or 6 or for a fragment or a variant of the same.

17. Method according to Claims 14 or 15, characterized in that the nucleic acid sequence coding for the surface marker is the sequence indicated in SEQ ID NO: 1, 3 or 5 or a fragment, mutant or variant of the same.

18. Method according to Claims 14 to 17, characterized in that the vector is a retroviral vector.

19. Method according to Claims 14 to 18, characterized in that the vector corresponding to DSM 13396 is used.

20. Method according to Claims 12 to 19, characterized in that the cells are human cells.

21. Method according to Claims 20, characterized in that the cells are T-lymphocytes.

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22. Kit for carrying out a method according to Claim 12, characterized in that it contains a vector according to Claims 1 to 5, means for the specific detection of the surface marker,

and further agents and aids required for carrying out the detection.

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23. Kit for carrying out a method according to Claim 14, characterized in that it contains a vector as mentioned in Claims 14 to 19, means for the specific detection of the surface marker and further agents and aids required for carrying out the detection.

24. Kit for carrying out a method according to Claim 13, characterized in that it contains a vector as mentioned in Claims 1 to 5, means for the specific binding of the surface marker and further agents and aids required for carrying out the detection.

25. Kit for carrying out a method according to Claim 15, characterized in that it contains a vector as mentioned in Claims 14 to 19, means for the specific binding of the surface marker and further agents and aids required for carrying out the detection.

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26. Use of a vector according to Claims 1 to 5 for *in vitro* transduction of T-lymphocytes.

27. Use of a vector according to Claims 1 to 5 for gene therapeutic treatment.

28. Use of T-lymphocytes which are transduced with a vector according to Claims 1 to 5, for gene therapeutic treatment.

29. Use of a vector which contains a nucleic acid sequence coding for the surface marker CD34, a fragment of the same or a variant of the same, for enrichment, detection and analysis of cells in

vitro that do not naturally express CD34, a fragment or a variant of the same.

30. Use according to Claim 29, characterized in that the vector is a vector as mentioned in Claims 12 to 17.

31. Gene therapeutic drug, containing a vector according to Claims 1 to 5.

32. Gene therapeutic drug, containing T-lymphocytes, which are transduced with a vector according to Claims 1 to 5.

33. Use of a nucleic acid sequence (marker gene) coding for the CD34 surface antigen or a fragment of the same or a variant of the same (marker) for the detection of genetically modified cells, characterized in that the nucleic acid sequence is incorporated into a gene transfer vector used for genetic modification, which contains a nucleic acid sequence (transgene) to be transferred into the cells, whereby the marker gene is chosen so that the marker is expressed on the surface of the cells to be transduced with the vector, whereby the transduced cells are identified by specific detection of the markers.

34. Use of a nucleic acid sequence (marker gene) coding for the CD34 surface antigen or a fragment of the same or a variant of the same (marker) for the detection of cells which do not naturally express CD34, a fragment or variant of the same, characterized in that the nucleic acid sequence is incorporated into a vector, wherein the marker gene is chosen, so that the marker is expressed on the surface of the cells transduced with the vector, in which the transduced cells are identified by specific detection of the marker.